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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/593,174

09/15/2006

Robert Donald Grapes

37261P121

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05/01/2009

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EXAMINER

BAYOU, AMENE SETEGNE

ART UNIT

PAPER NUMBER

3746

MAIL DATE

DELIVERY MODE

05/01/2009

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/593,174	<b>Applicant(s)</b> GRAPES, ROBERT DONALD	
	<b>Examiner</b> AMENE S. BAYOU	<b>Art Unit</b> 3746	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 17 February 2009.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-21 is/are pending in the application.
- 4a) Of the above claim(s) 1, 2 and 8 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 3-7, 9-21 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 15 September 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)          | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____  | 6) <input type="checkbox"/> Other: _____                          |

## **DETAILED ACTION**

### ***Continued Examination Under 37 CFR 1.114***

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 02/17/09 has been entered.

### ***Specification***

2. The abstract of the disclosure is objected to because it contains the phrase "means for". Applicant is reminded of the proper language and format for an abstract of the disclosure. The form and legal phraseology often used in patent claims, such as "means" and "said," should be avoided. The abstract should describe the disclosure sufficiently to assist readers in deciding whether there is a need for consulting the full patent text for details. Correction is required. See MPEP § 608.01(b).

### ***Claim Rejections - 35 USC § 102***

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that forms the basis for the rejections under this section made in this Office action.

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 19, 3-7, 9, 16,17,20,21 are rejected under 35 U.S.C. 102(b) as being anticipated by Polaschegg (US patent number 4634430).

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5. In re claim 19, Polaschegg disclose a pumping system including:
  - A pump (10) ,in figure 1 ,comprising a housing (12), a cavity (16,18) with opposing surfaces , an inlet port opening (20) into the cavity (16), an outlet port opening (22) from the cavity (16) , a pressure port (32) connected to the cavity (18), a bi-stable flexible membrane (40,column 4 lines 20-30) located within the cavity (16,18), wherein the flexible membrane (40) being mounted within the housing (12) and a pre-set is applied to the flexible membrane (column 4 lines 20-30) such that the membrane adopts a first stable state in contact with one of the opposing surfaces of the cavity and can be caused to invert into a second stable state by the application of pressure to the cavity via the pressure port (32) , wherein the bi-stable membrane (40) is movable between the first and second stable states and wherein the first and second stable states correspond to completion of inlet and exhaust of a pumping cycle, respectively (column 6,lines 34-65).
6. In re claim 3, Polaschegg disclose a pumping system including:
  - The membrane (40) is formed from an elastomeric material, in column 4, line 35-40.
7. In re claim 4, Polaschegg disclose a pumping system including:
  - The membrane (40) is formed from elastomeric sheet material, in column 4, line 35-40.
8. In re claim 5, Polaschegg disclose a pumping system including:

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- The membrane (40) is damped between first and second sections of the housing (41 and 42 respectively) each housing section (41,42) with one of the opposing surfaces having a cavity section such that when the housing sections (41,42) are assembled to form the housing, the cavity with opposing surfaces is formed, in figure 1.
9. In re claim 6, Polaschegg disclose a pumping system including:
- A pressure port (32) opens into cavity (cavity between 41, 42), pressure port being (32) connectable to a source or sources of positive and negative pressures (14), in figure 1.
10. In re claim 7, Polaschegg disclose a pumping system including:
- A device (14) to cyclically apply the positive and negative pressures to the cavity to cause the membrane (40) to move between the stable states, in figure 1 and column 3, lines 44-49.
11. In re claim 9, Polaschegg disclose a pumping system including:
- The housing sections (41, 42) are joined together and to clamp the membrane (40) about a peripheral margin thereof, in figure 1 and column 4, lines 31-40.
12. In re claim 16, Polaschegg disclose a pumping system including:
- The cavity (cavity between 41, 42) is elongate and of curved cross-section, in figure 1.
13. In re claim 17, Polaschegg disclose a pumping system including:
- The ends of the elongate cavity (cavity between 41, 42) are complex curved, in figure 1.

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14. In re claim 20, Polaschegg disclose a pumping system including:

- The clamping of the membrane (40) creates further compressive forces in the membrane (inherently and also indicated in column 4, lines 20-30).

15. In re claim 21, Polaschegg disclose a pumping system including:

- A cavity with opposing surfaces (formed between inner surfaces of 41 and 42); inlet and outlet passages (20,22,32) communicating with the cavity ;a pressure port (32) connected to the cavity; and a bi stable flexible membrane (40) located within the cavity; wherein the flexible membrane (40): a) has a first stable state and a second stable state (figure 1 and column 4 lines 20-30) and can be caused to invert from one stable state to the other stable state by application of positive or negative pressure to the cavity (using pump 14) via the pressure port (32),and wherein in the first stable state the membrane is in contact with one of the opposing surfaces, the first stable state corresponding to the completion of an inlet stage of a pumping cycle and in the second stable state the membrane (40) is in contact with the other opposing surface ,the second stable state corresponding to completion of an exhaust stage of the pumping cycle, in figure 1 and column 4 lines 20-30 , column 6,lines 34-65.

### ***Claim Rejections - 35 USC § 103***

16. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

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17. Claims 10,12,13 are rejected under 35 U.S.C 103(a) as being unpatentable over Polaschegg as applied to claim 5 in view of Behringer et al. ( US patent number 5902096).

18. In re claim 10 Polaschegg disclose the claimed invention except the following limitation which is taught by Behringer et al.:

- The first housing section (41 or 42) includes a recess into which the membrane (40) is located, the peripheral dimensions of the membrane being greater than those of the recess whereby compressive forces are set up in the membrane when it is installed in the recess to thereby create the preset, in figure 1 and 2 and column 3, lines 30-50.

19. It would have been obvious to one skilled in the art to choose the proper tolerance of the housing in to which the membrane is clamped as taught by Behringer et al in order to achieve the required degree of membrane compression (which is clearly indicated by Behringer et al). Please also note that Polaschegg even teaches that the membrane can be disposed already biased a certain amount in the housing (see column 4, lines 24-28).

20. In re claim 12, Polaschegg in view of Behringer et al. disclose the claimed invention:

Behringer et al. disclose:

- A third housing section (50) coupled to the second housing section (30) , third housing section including means for facilitating connection (57) of inlet (40) and outlet conduits (43) for pumpable material. It would have been obvious to one

skilled in the art to add a third housing part as taught by Behringer et al in order to separately manufacture elements of the pumping system and easily assemble them at final installation.

21. In re claim 13, Polaschegg in view of Behringer et al. as applied to claim 12 disclose the claimed invention:

Behringer et al. disclose:

- A pump (1), in figure 1, wherein the second (30) and third housing (50) sections include inlet (40, 41) and outlet openings (42, 43) and means for locating therein a valve (35).

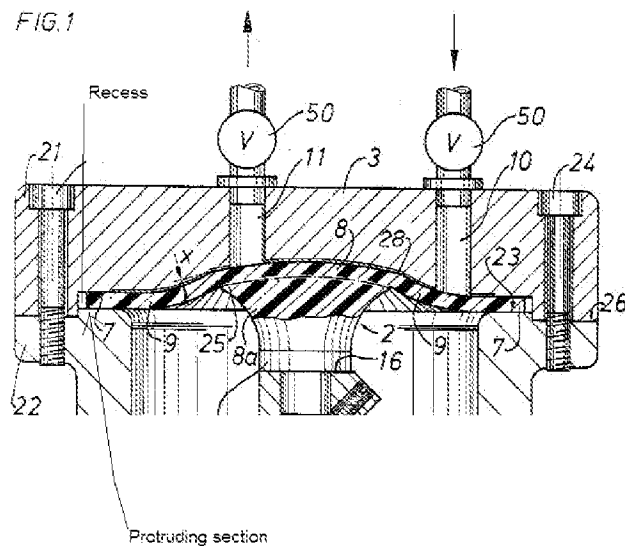
22. Claim 11, is rejected under 35 U.S.C 103(a) as being unpatentable over Polaschegg as applied to claim 6 in view of Becker (US patent number 3947156).

23. In re claim 11, Polaschegg disclosed the claimed invention including:

- The second housing section (41 or 42) which engages in the recess when the first and second housing sections are combined together, to cause the membrane (40) to be clamped in place, in figure 1. and 2. Polaschegg, However fails to disclose the following limitation which is taught by Becker:
- The second housing section (k) includes a protruding portion (as shown below), in figure 1.



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24. It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the diaphragm pump of Polaschegg by making protrusion in the second housing section as taught by Becker in order to have better clamping capability.

25. Claim 14 is rejected under 35 U.S.C 103(a) as being unpatentable over Polaschegg in view of Behringer et al as applied to claim 13 further in view of Dilworth (US patent number 3900276).

26. In re claim 14, Polaschegg in view of Behringer et al disclosed the claimed invention except the following limitation which is taught by Dilworth:

- A pump (10) wherein the valve element (74) is a disk of flexible material, in figure 1 and column 5, lines 6-7.

27. It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the diaphragm pump of Polaschegg in view of

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Behringer et al by selecting a flexible disc valve as taught by Becker'156 in order to move the valve easily during opening and closing.

28. Claim 15 is rejected under 35 U.S.C 103(a) as being unpatentable over Polaschegg as applied to claim 6 in view of Eickmann (US patent number 4904167).

29. In re claim 15, Polaschegg disclose the claimed invention except the following limitation which is taught by Eickmann:

- The pressure port (top of 1524) is offset in the length of the cavity, clearly shown in figure 4.

30. It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the diaphragm pump of Polaschegg by offsetting the location of the pressure port in relation to the membrane as taught by Eickmann in order to allow the buckling movement of the membrane to progress predominantly in one direction along the horizontal (X) axis.

### ***Conclusion***

31. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Amene S. Bayou whose telephone number is 571-270-3214. The examiner can normally be reached on Monday-Thursday, 9:00 am-5:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Devon Kramer can be reached on 571-272-7118. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300. Information regarding the status of an application may be obtained from the Patent

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/Devon C Kramer/  
Supervisory Patent Examiner, Art  
Unit 3746